

REMARKS

Reconsideration and withdrawal of the rejections set forth in the Office Action dated September 12, 2008, is respectfully requested in view of this amendment.

By this amendment, Claims 2, 7, 11, 13, 14, 17, 19 and 38 have been cancelled without prejudice or disclaimer to the subject matter therein. Claims 1, 3, 5, 9, 10, 15, and 21 have been amended, and claims 4, 8, 12, 16, 18 and 25 have been amended with respect to dependencies only. Claims 1, 3-6, 8-10, 12, 15-16, 18 and 20-37 are pending in this application and presented for examination.

Claim 1 has been amended to incorporate the features of original Claims 2, 7, 11, 13, 17 and 19. In addition, Claim 1 has been amended to more precisely define the nature of the beam produced by the excitation source. Support for this amendment can be found, for example on page 8, lines 28 to page 9, line 17 and from Figures 2 and 3.

Claims 10 and 15 have been amended to better define the shape and orientation of the preferred beam. Amendments have been made where necessary to the remaining claims for consistency with Claim 1. The cancellation of claims 33-35 and the limitations as applied to the remaining independent claims is made without prejudice to later prosecution of the subject matter of these claims in this application or a subsequent continuation application. It is respectfully submitted that the above amendments introduce no new matter within the meaning of 35 U.S.C. §132.

In the outstanding Office Action, the Examiner objected to the specification in that the title was not descriptive, and objected to claim 25 as depending from claim 25. Claims 1-14, 16-19, 23, and 38 were rejected under 35 U.S.C. §102(b) as anticipated by PCT Application WO 03/023379 (Tokhtuev et al., hereinafter "*Tokhtuev*"). Claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,983,846 (Rios et al., hereinafter "*Rios*"). Claims 21 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Rios* in view of Japanese reference no. JP 04237114 (to Shibata; hereinafter "*Shibata*"). Claims 24,

26, and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent No. 4,005,605 (Michael, hereinafter "*Michael*"). Claim 25 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Michael* as applied to Claim 24 and further in view of U.S. Patent No. 3,996,476 (Lazzara, hereinafter "*Lazzara*"). Claims 27 – 30 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent No. 4,496,839 (Bernstein et al., hereinafter "*Bernstein*"). Claim 32 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent Application Publication No. 2005/0174793 (Field, hereinafter "*Field*"). Claim 33 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent No. 3,554,653 (Zielke et al., hereinafter "*Zielke*"). Claims 31 and 35 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent No. 6,157,033 (Chudnovsky, hereinafter "*Chudnovsky*"). and Claim 36 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of U.S. Patent No. 5,947,051 (Geiger, hereinafter "*Geiger*").

Objections to the Specification

The Examiner objected to the specification in that the title was not descriptive, and objected to claim 25.

Response

The amended Specification and Claims are believed to fully address these issues. In doing so, Claim 25 has been made dependent from Claim 24, which is consistent with the examination.

Rejections under 35 USC §102

Claims 1–14, 16–19, 23, and 38 were rejected under 35 U.S.C. §102(b) as anticipated by *Tokhtuev*. Claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by *Rios*.

Response

This rejection is traversed as follows. For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP §2131.

Applicants' Claim 1 sets forth:

"... one or more light emitting diodes (LEDs), ... [a] lens arranged to ... form a substantially collimated elongate beam ... with a modulating signal having a modulating frequency ... means for detecting ... and ... converting said received light into a corresponding electrical signal ... a signal component of substantially the same frequency as said modulation frequency ... means for performing spectral analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency ... the fluorometer is capable of detecting fluorescent material located remotely from the fluorometer."

With regard to amended Claim 1, *Tokhtuev* does not disclose an excitation system that produces a substantially collimated, elongate beam that projects, during use, from the fluorometer. Instead, the excitation light produced by *Tokhtuev*'s LEDs is focused to a point immediately in front of the fluorosensor (see for example Figure 2 of *Tokhtuev* and paragraph [35] lines 13 to 16).

Further, *Tokhtuev* does not disclose that the detection system includes means for detecting, in the electrical signal produced by the light receiving and converting means, a single component of substantially the same frequency as the modulation frequency, the detecting means including means for performing spectral analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency.

In contrast, *Tokhtuev* only amplifies the electrical signals produced by its photodiodes and then converts the amplified signal from analogue to digital (see paragraph [35] lines 20 to 23 from which it can be seen that the electrical signal is amplified first by the preamplifiers 29a and 29b and then by the lock-in amplifiers 8 and 9 before being converted by the A to D converter 13). *Tokhtuev* does not attempt to detect a signal component of the electrical signal that corresponds to the modulation frequency by spectral analysis and to determine the value of the spectral component of the electrical signal corresponding to the modulation frequency. In the final paragraph of page 5 of the examination report, the Examiner contends that *Tokhtuev* does teach performing a spectral analysis of electrical signal at paragraphs [35], [18] and [19]. The Applicant respectfully disagrees. Paragraph [35] of *Tokhtuev*, which deals with the relevant electrical signal, is silent with regard to spectral analysis, while paragraphs [18] and [19] are concerned with the optical spectra of the fluorescents. This is unrelated to the electrical signal produced by the photodiodes.

With regard to *Rios* (US 4983846), *Rios* does not disclose at least one lens in the excitation system arranged to cause the excitation light from the LEDs to form a substantially collimated elongate beam that projects, during use from the fluorometer. *Rios* does not disclose means for modulating the elongate beam with the modulating signal having a modulating frequency. *Rios* does not disclose that the detection system has means for detecting in the electrical signal produced by the light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency, said detecting means including

means for performing spectral analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency.

It is respectfully submitted therefore that amended Claim 1 is novel over both *Tokhtuev* and *Rios* by virtue of the features identified above.

Applicants respectfully submit that neither the *Tokhtuev* reference nor the *Rios* reference teach or suggest all the features as recited in Claims 1–14, 16–19, 23, and 38 of the present application. It is therefore respectively submitted that the rejection under 35 U.S.C. §102 should be withdrawn.

Rejections Under 35 U.S.C. §103

The Examiner rejected Claims 21 and 22 under 35 U.S.C. 103(a) as being unpatentable over *Rios* in view of *Shibata*. Claims 24, 26, and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Michael*. Claim 25 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Michael* and *Lazzara*. Claims 27 – 30 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Bernstein*. Claim 32 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Field*. Claim 33 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Zielke*. Claims 31 and 35 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Chudnovsky*. and Claim 36 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Tokhtuev* in view of *Geiger*.

Response

This rejection is traversed as follows. To establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) the prior art references teach or suggest all of the

claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

A *prima facie* case of obviousness must also include a showing of the reasons why it would be obvious to modify the references to produce the present invention. *See Dystar Textilfarben GMBH v. C. H. Patrick*, 464 F.3d 1356 (Fed. Cir. 2006). The Examiner bears the initial burden to provide some convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings. *Id.* at 1366.

The claims rejected under 35 U.S.C. §103(a) are directly or indirectly dependent on Claim 1. As such, Applicants respectfully submit that the secondary references do not cure all of the deficiencies of *Tokhtuev* and *Rios*, and thus the claims are not obvious over the combination set forth in the Office Action.

With regard to Claim 21, the adjustability taught by *Shibata* changes the angles of incidence and reflection of the excitation beam and reflected beam on a target which is a fixed distance from the light source unit 20 and the protection unit 50. It is noted that the light source unit 20 and detection unit 50 of *Shibata* are not adjustably interconnected as required by Claim 21. The adjustable interconnection of the housings recited in Claim 21 enables changes in the distance at which the excitation beam and the protection volume overlap with respect to the housings, i.e. it allows adjustment of the range of the fluorometer. This is neither disclosed nor suggested by *Shibata*. Claim 21 has been amended to emphasise this difference. Therefore it is respectfully submitted that Claim 21, and its dependent claims, are non-obvious over the individual and combined teachings of *Rios* and *Shibata*.

It is noted that the *Tokhtuev* and *Rios* devices are only capable of detecting fluorescence that occurs relatively close to the device (immediately beside the device in the case of *Tokhtuev*, and about 8 inches in the case of *Rios*). In contrast, the fluorometer of Claim 1 is capable of detecting fluorescence at larger distances from the fluorometer. This is achieved by the elongate

collimated beam which extends the range of fluorometer, and by the modulation and spectral analysis which facilitates the detection of low levels of fluorescence.

Accordingly, in view of the amendments made to Claim 1 it is respectfully submitted that Claim 1 is novel and non-obvious when compared to the cited prior art. The remaining claims, being dependent directly or indirectly on Claim 1, are also submitted as being novel and non-obvious for the reasons stated above.

The cited prior art combination therefore fails to show or suggest Applicants' claimed subject matter as set forth in Claims 1, 3-6, 8-10, 12, 15-16, 18 and 20-37. It is therefore respectively submitted that the rejection under 35 U.S.C. 103(a) should be withdrawn.

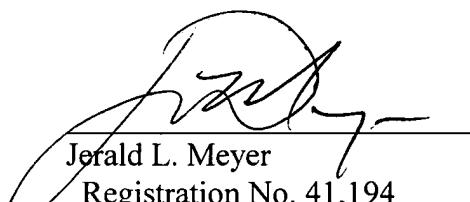
CONCLUSION

In light of the foregoing, Applicants submit that the application is in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner call the undersigned.

Respectfully submitted,
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